REMARKS

We have canceled claim 97. Claims 1, 4-8, 10-22, and 98 are pending in this application.

The examiner rejected claims 1 and 4 under 35 U.S.C. §102(b) as supposedly anticipated by U.S. 6,301,306 to McDonald et al. (McDonald).

We note, however, that McDonald relates to conventional QPSK modulation and QPSK is not relevant to the present claimed invention.

In support of the rejection, the examiner argues:

> McDonald et al discloses a method and apparatus fig. 5 comprising modulating in modulator 518 a carrier signal generated by source 515 by a subcarrier modulation signal note output of modulator 509[.] Note that McDonald teaches that a QPSK modulation scheme is used to generate the subcarrier modulated signal[.] [As] known in the art a QPSK modulated signal comprises a number of m amplitude levels where m>2, note col. 10, lines 53-54.

However, it appears to that the passage to which the examiner has directed our attention (i.e., col. 10, lines 53-54) does not relate to Fig. 5. Rather, it relates to a demodulator shown in Fig. 11.

A better basis for disclosure of QPSK would be col. 10, lines 13 to 16, which reads "When an alternate embodiment of the subcarrier modulator 509 such as a QPSK modulator is implemented by the transmitting unit…"; and col. 7, lines 29 to 32, which reads "In an alternate embodiment, the subcarrier modulator 509 may be a QPSK modulator that produces a QPSK output as one of ordinary skill in the art will readily recognise" amongst others.

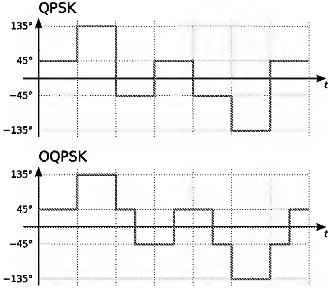
We note that the examiner continues to indicate "As per claim 4, as known in the art QPSK modulation uses 4 amplitude levels". However, this characterization of QPSK is incorrect and represents a misunderstanding of the fundamentals of QPSK that, in turn, has lead to a misunderstanding of the disclosure found in the other references cited by the examiner, namely, U.S. 6,052,701; U.S. 7,272,416; and US 7,583,759.

One of ordinary skill in the art would understand that an M-PSK signal can be expressed in the general case for M phases states as follows:

$$s_i(t) = \sqrt{\frac{2E_s}{T}} \cos\left[2\pi f_c t + \frac{2\pi(i-1)}{M}\right], \text{ where } i = 1, \ldots, M$$

It can be appreciated that for the case where M=4, one has QPSK. In any event, it can be appreciated that the carrier term, $2\pi f_c t$, changes only with time in a continuous manner, the phase or phase modulating term, $\frac{2\pi(i-1)}{M}$, changes according to the data and the amplitude, $\sqrt{\frac{2E_s}{T}}$, remains constant and is unaffected by the modulation. One skilled in the art expects this results because QPSK uses four phase states as opposed to four amplitude levels.

The typical diagrams that one skilled in the art associates with QPSK and OQPSK are as follows:



However, the above diagrams are misleading and, in fact, are not representations of modulation signals having multiple amplitude levels. In any one of the above diagrams, they are representations of the phase states of a pair of signals each having the amplitudes selected from two possible amplitude levels. Any given phase state, such as $\pi/4$, is adopted as a representation as a

combination of two binary signals, each having amplitudes given by $\sqrt{E_s}$, where E_s is the energy per symbol. In the general case, the amplitudes are $\pm\sqrt{E_s}$.

For at least the reasons stated above, we believe that the claims are in condition for allowance and therefore ask the Examiner to allow them to issue.

Please apply any charges not covered, or any credits, to Deposit Account No. 08-0219, under Order No. 2001145.00120US1 from which the undersigned is authorized to draw.

Respectfully submitted,

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